

What is claimed is:

1. A retarder comprising:

a substrate having a longitudinal direction,

a first optically anisotropic layer formed of a composition comprising a rod-like liquid-crystalline compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of π at 550 nm, and

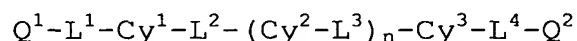
a second optically anisotropic layer formed of a composition comprising a rod-like liquid-crystalline compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of $\pi/2$ at 550 nm;

wherein an in-plane slow axis of the first optically anisotropic layer and the longitudinal direction of the substrate cross substantially at +30 degrees, an in-plane slow axis of the second optically anisotropic layer and the longitudinal direction of the substrate cross substantially at -30 degrees, and the in-plane slow axis of the second optically anisotropic layer and the in-plane slow axis of the first optically anisotropic layer cross substantially at 60 degrees.

2. The retarder of claim 1, wherein a rubbing axis of an alignment layer for predetermining an orientation angle of the rod-like molecules in the first optically anisotropic layer and the longitudinal direction of the substrate cross substantially at +30 degrees, and a rubbing axis of an alignment layer for predetermining an orientation angle of the rod-like molecules in the second optically anisotropic layer and the longitudinal direction of the substrate cross substantially at -30 degrees.

3. The retader of claim 1, wherein at least one of the first and second optically anisotropic layers is formed of a composition comprising a rod-like liquid-crystalline compound denoted by Formula (I) bellow:

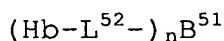
Formula (I)



where Q^1 and Q^2 respectively denote a polymerizable group; L^1 and L^4 respectively denote a divalent linking group, L^2 and L^3 respectively denote a single bond or divalent linking group; Cy^1 , Cy^2 , and Cy^3 respectively denote a divalent cyclic group; and n is 0, 1 or 2.

4. The retader of claim 1, wherein at least one of the first and second optically anisotropic layers is formed of a composition comprising a compound denoted by Formula (V) bellow:

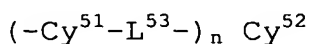
Formula (V)



where Hb represents a C6-40 aliphatic group, or oligosiloxanoxy group having a C6-40 aliphatic group; L^{52} is a single bond or divalent linking group; B^{51} is an n -valent group showing an excluded volume effect and comprising at least three rings and n is an integer from 2 to 12.

5. The retader of claim 4, wherein B^{51} is an n -valent group denoted by Formula (V-a);

Formula (V-a)



where Cy^{51} is a divalent cyclic group; L^{53} is a divalent

linking group selected from the group consisting of a single bond, -alkylene-, -alkenylene-, -alkynylene-, -O-, -S-, -CO-, -NR-, -SO₂- and any combinations thereof; Cy⁵² is an n-valent cyclic group; and n is an integer from 2 to 12.

6. A process for preparing a retarder comprising:

(i) a step of preparing a layer on or above a surface of a substrate having a longitudinal direction and rubbing a surface of the layer in a direction at +30 degrees relative to the longitudinal direction of the substrate, to prepare a first alignment layer capable of aligning rod-like liquid-crystalline molecules in a direction parallel to a rubbing axis,

(ii) a step of applying a composition comprising a rod-like liquid-crystalline compound to the rubbed surface of the first alignment layer and aligning rod-like molecules homogenously in a direction parallel to the rubbing axis of the first alignment layer, to prepare a first optically anisotropic layer generating substantially a phase difference of π at 550 nm,

(iii-1) a step of preparing a layer on or above the surface of the substrate and rubbing a surface of the layer in a direction at -30 degrees relative to the longitudinal direction of the substrate, namely, in a direction crossing the rubbing axis of the first alignment layer at 60 degrees, to prepare a second alignment layer capable of aligning rod-like liquid-crystalline molecules in a direction parallel to a rubbing axis, or

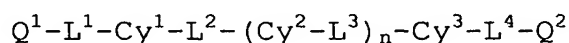
(iii-2) a step of preparing a layer on or above a rear surface of the substrate and rubbing a surface of the layer in a direction at +30 degrees relative to the longitudinal direction of the substrate, namely, in a direction crossing the rubbing

axis of the first alignment layer at 60 degrees, to prepare a second alignment layer capable of aligning rod-like liquid-crystalline molecules in a direction parallel to a rubbing axis, and

(iv) a step of applying a composition comprising a rod-like liquid-crystalline compound to the rubbed surface of the second alignment layer and aligning rod-like molecules homogenously in a direction parallel to the rubbing axis of the second alignment layer, to prepare a second optically anisotropic layer generating substantially a phase difference of $\pi/2$ at 550 nm.

7. The process of claim 6, wherein at least one of the rod-like liquid-crystalline compounds used in the first and second optically anisotropic layers is denoted by Formula (I) bellow:

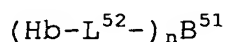
Formula (I)



where Q^1 and Q^2 respectively denote a polymerizable group; L^1 and L^4 respectively denote a divalent linking group, L^2 and L^3 respectively denote a single bond or divalent linking group; Cy^1 , Cy^2 , and Cy^3 respectively denote a divalent cyclic group; and n is 0, 1 or 2.

8. The process of claim 6, wherein at least one of the compositions for the first and second optically anisotropic layers comprises a compound denoted by Formula (V) bellow:

Formula (V)

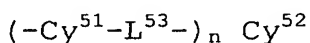


where Hb represents a C6-40 aliphatic group, or

oligosiloxanoxy group having a C6-40 aliphatic group; L^{52} is a single bond or divalent linking group; B^{51} is an n-valent group showing an excluded volume effect and comprising at least three rings and n is an integer from 2 to 12.

9. The process of claim 6, wherein B^{51} is an n-valent group denoted by Formula (V-a);

Formula (V-a)



where Cy^{51} is a divalent cyclic group; L^{53} is a divalent linking group selected from the group consisting of a single bond, -alkylene-, -alkenylene-, -alkynylene-, -O-, -S-, -CO-, -NR-, -SO₂- and any combinations thereof; Cy^{52} is an n-valent cyclic group; and n is an integer from 2 to 12.

10. A circular polarizer comprising:

a linear polarizer film having a transparent axis substantially inclined at +45 degrees or -45 degrees relative to a longitudinal direction thereof,

a substrate having a longitudinal direction,

a first optically anisotropic layer formed of a composition comprising a rod-like liquid-crystalline compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of π at 550 nm, and

a second optically anisotropic layer formed of a composition comprising a rod-like liquid-crystalline compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of $\pi/2$ at 550 nm;

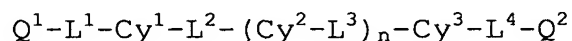
wherein an in-plane slow axis of the first optically

anisotropic layer and the longitudinal direction of the substrate cross substantially at +30 degrees, an in-plane slow axis of the second optically anisotropic layer and the longitudinal direction of the substrate cross substantially at -30 degrees, and the in-plane slow axis of the second optically anisotropic layer and the in-plane slow axis of the first optically anisotropic layer cross substantially at 60 degrees.

11. The circular polarizer of claim 10, wherein a rubbing axis of an alignment layer for predetermining an orientation angle of the rod-like molecules in the first optically anisotropic layer and the longitudinal direction of the substrate cross substantially at +30 degrees, and a rubbing axis of an alignment layer for predetermining an orientation angle of the rod-like molecules in the second optically anisotropic layer and the longitudinal direction of the substrate cross substantially at -30 degrees.

12. The circular polarizer of claim 10, wherein at least one of the first and second optically anisotropic layers is formed of a composition comprising a rod-like liquid-crystalline compound denoted by Formula (I) below:

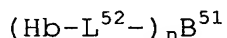
Formula (I)



where Q^1 and Q^2 respectively denote a polymerizable group; L^1 and L^4 respectively denote a divalent linking group, L^2 and L^3 respectively denote a single bond or divalent linking group; Cy^1 , Cy^2 , and Cy^3 respectively denote a divalent cyclic group; and n is 0, 1 or 2.

13. The circular polarizer of claim 10, wherein at least one of the first and second optically anisotropic layers is formed of a composition comprising a compound denoted by Formula (V) bellow:

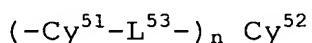
Formula (V)



where Hb represents a C6-40 aliphatic group, or oligosiloxanoxo group having a C6-40 aliphatic group; L^{52} is a single bond or divalent linking group; B^{51} is an n-valent group showing an excluded volume effect and comprising at least three rings and n is an integer from 2 to 12.

14. The circular polarizer of claim 13, wherein B^{51} is an n-valent group denoted by Formula (V-a);

Formula (V-a)



where Cy^{51} is a divalent cyclic group; L^{53} is a divalent linking group selected from the group consisting of a single bond, -alkylene-, -alkenylene-, -alkynylene-, -O-, -S-, -CO-, -NR-, -SO₂- and any combinations thereof; Cy^{52} is an n-valent cyclic group; and n is an integer from 2 to 12.

15. A process for preparing a circular polarizer comprising:

(i) a step of preparing a layer on or above a surface of a substrate having a longitudinal direction and rubbing a surface of the layer in a direction at +30 degrees relative to the longitudinal direction of the substrate, to prepare a first

alignment layer capable of aligning rod-like liquid-crystalline molecules in a direction parallel to a rubbing axis,

(ii) a step of applying a composition comprising a rod-like liquid-crystalline compound to the rubbed surface of the first alignment layer and aligning rod-like molecules homogenously in a direction parallel to the rubbing axis of the first alignment layer, to prepare a first optically anisotropic layer generating substantially a phase difference of π at 550 nm,

(iii-1) a step of preparing a layer on or above the surface of the substrate and rubbing a surface of the layer in a direction at -30 degrees relative to the longitudinal direction of the substrate, namely, in a direction crossing the rubbing axis of the first alignment layer at 60 degrees, to prepare a second alignment layer capable of aligning rod-like liquid-crystalline molecules in a direction parallel to a rubbing axis, or

(iii-2) a step of preparing a layer on or above a rear surface of the substrate and rubbing a surface of the layer in a direction at +30 degrees relative to the longitudinal direction of the substrate, namely, in a direction crossing the rubbing axis of the first alignment layer at 60 degrees, to prepare a second alignment layer capable of aligning rod-like liquid-crystalline molecules in a direction parallel to a rubbing axis,

(iv) a step of applying a composition comprising a rod-like liquid-crystalline compound to the rubbed surface of the second alignment layer and aligning rod-like molecules homogenously in a direction parallel to the rubbing axis of the second alignment layer, to prepare a second optically anisotropic layer generating substantially a phase difference of $\pi/2$ at 550 nm,

and

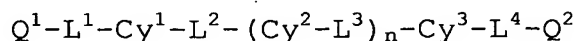
(v) a step of laminating a linear polarizer film, having a transparent axis substantially inclined at +45 degrees or -45 degrees relative to a longitudinal direction thereof, on or above the surface or the rear surface of the substrate, so that the longitudinal directions of the linear polarizer film and of the substrate are identical.

16. The process of claim 15, wherein the first and second optically anisotropic layers are prepared on or above the surface of the substrate and the linear polarizer film is laminated on or above the surface of the substrate.

17. The process of claim 15, wherein the first and second optically anisotropic layers are prepared on or above *the surface* of the substrate and the linear polarizer film is laminated on or above the rear surface of the substrate.

18. The process of claim 15, wherein at least one of the rod-like liquid-crystalline compounds used in the first and second optically anisotropic layers is denoted by Formula (I) bellow:

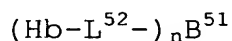
Formula (I)



where Q^1 and Q^2 respectively denote a polymerizable group; L^1 and L^4 respectively denote a divalent linking group, L^2 and L^3 respectively denote a single bond or divalent linking group; Cy^1 , Cy^2 , and Cy^3 respectively denote a divalent cyclic group; and n is 0, 1 or 2.

19. The process of claim 15, wherein at least one of the composition used for the first and second optically anisotropic layers comprises a compound denoted by Formula (V) below:

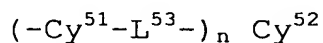
Formula (V)



where Hb represents a C6-40 aliphatic group, or oligosiloxanoxy group having a C6-40 aliphatic group; L^{52} is a single bond or divalent linking group; B^{51} is an n-valent group showing an excluded volume effect and comprising at least three rings and n is an integer from 2 to 12.

20. The process of claim 19, wherein B^{51} is an n-valent group denoted by Formula (V-a);

Formula (V-a)



where Cy^{51} is a divalent cyclic group; L^{53} is a divalent linking group selected from the group consisting of a single bond, -alkylene-, -alkenylene-, -alkynylene-, -O-, -S-, -CO-, -NR-, -SO₂- and any combinations thereof; Cy^{52} is an n-valent cyclic group; and n is an integer from 2 to 12.